Online-Only Abstracts

Exposure to ertapenem is possibly associated with *Pseudomonas aeruginosa* antibiotic resistance

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Abstract

The role of antibiotic exposure in the evolution and emergence of resistance is challenging to assess. We used carbapenem-resistant *Pseudomonas aeruginosa* (PA) phenotypes to assess possible factors that are associated with the occurrence and prognosis of such a phenotype and to examine the possible contribution of antibiotic exposure to the evolution of antimicrobial resistance. We conducted a nested case-control study. Cases were defined as patients from whom carbapenem-resistant ureidopenicillin-sensitive PA (CRUS-PA) was isolated; matched controls were PA patients who did not have isolation of CRUS-PA. We analysed potential predictors of CRUS-PA isolation and assessed their clinical significance (mortality and eventual isolation of pan-resistant PA), taking into account antibiotic exposures. We matched 800 case-control pairs. Case patients were more likely to have been exposed to anti-PA carbapenems (OR = 6.9; 95% CI, 2.5–18.6). This finding did not apply to the administration of other antibiotics. The mortality among CRUS-PA patients was similar to that of the controls (HR, 0.8 95%; CI, 0.6–1.1). Subsequent isolation of pan-resistant PA was more frequent among case patients compared with non-pan-resistant controls (p-value <0.05). Among cases, the risk of eventual pan-resistant PA isolation was increased in ertapenem recipients, only after and not prior to the index specimen date (HR, 1.9, 95%; CI, 1.01–3.4). Therefore we suggest that the CRUS-PA phenotype may represent pan beta-lactam resistance and that antibiotic exposure is associated with evolution of PA resistance phenotypes. We demonstrate a novel association of ertapenem with sequentially appearing PA resistance patterns.

Mediastinitis due to Gram-negative bacteria is associated with increased mortality

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Abstract

The aim of this study was to describe the features of a large cohort of patients with postoperative mediastinitis, with particular regard to Gram-negative bacteria (GNB), and assess their outcome. This bicentric retrospective cohort included all patients who were hospitalized in the Intensive Care Unit with mediastinitis after cardiac surgery during a 9-year period. Three hundred and nine patients developed a mediastinitis with a mean age of 65 years and a mean standard Euroscore of six points. Ninety-one patients (29.4%) developed a GNB mediastinitis (GNBm). Of the 364 pathogens involved, 103 GNB were identified. GNBm were more frequently polymicrobial (44% versus 3.2%; p <0.001). Being female was the sole independent risk factor of GNBm in multivariate analysis. Initial antimicrobial therapy was significantly more frequently inappropriate with GNBm compared with other microorganisms (24.6% versus 1.9%; p <0.001). Independent risk factors for inappropriateness of initial antimicrobial treatment were GNBm (OR = 8.58, 95%CI 2.53–29.02, p 0.0006), and polymicrobial mediastinitis (OR = 4.52, 95%CI 1.68–12.12, p 0.0028). GNBm were associated with more drainage failure, secondary infection, need for prolonged mechanical ventilation and/or use of vasopressors. Thirty-day hospital mortality was significantly higher with GNBm (31.9 % versus 17.0%; p 0.004). GNBm was identified as an independent risk factor of hospital mortality (OR = 2.31, 95%CI 1.16–4.61, p 0.0179).